CLAIMS

We claim:

1. A method for producing a precipitated calcium carbonate for ink jet recording paper comprising:
    a) Admixing calcium oxide with water to produce a calcium hydroxide slurry;
    b) admixing a first amount of an organophosphonate followed by adding aluminum sulfate to the calcium hydroxide slurry;
    c) introducing carbon dioxide to the calcium hydroxide slurry to produce a precipitated calcium carbonate slurry;
    d) adding a second amount of organophosphonate to the precipitated calcium carbonate slurry;
    e) admixing phosphoric acid to the precipitated calcium carbonate slurry;
    f) screening and dewatering the calcium carbonate slurry; and
    g) milling the precipitated calcium carbonate in the presence of an amphoteric or anionic dispersant to produce a precipitated calcium carbonate product.
2. The method of Claim 1 wherein the first organophosphonate is selected from the group consisting of nitrilo-tris-(methylene phosphonic acid), ethylenediaminetetra (methylene phosphonic acid), diethylenetriaminepenta (methylene phosphonic acid), hydroxy ethane-1, 1-diphosphonic acid, ethanolamine, ethanolamine bis-(methylenephosphonic acid), N-dimethylene phosphonic acid, and hexamethylenediaminetetra (methylene phosphonic acid).

3. The method of Claim 2 wherein the first amount of the organophosphonate is employed at a level of from about 0.04 percent by weight calcium hydroxide slurry to about 0.15 percent by weight calcium hydroxide slurry and wherein the aluminum sulfate is from about 2.5 percent by weight calcium hydroxide slurry to about 4.5 percent by weight calcium hydroxide slurry.

4. The method of Claim 3 wherein the first organophosphonate is ethanolamine bis-(methylenephosphonic acid).

5. The method of Claim 1 wherein the second organophosphonate is employed at a level of from about 0.50 percent weight PCC slurry to about 1.0 percent weight PCC slurry.

6. The method of Claim 5 wherein the second organophosphonate is ethanolamine bis-(methylenephosphonic acid).

7. The method of Claim 1 wherein the amphoteric dispersant is selected from the group consisting of sodium salts of co-polymers of acrylic acid and diallyldimethylammonium chloride (DMDAAC), sodium salts of co-polymers of acrylic acid and methyl chloride quaternaryamine of dimethylaminoethylacrylate (DMAEA:quaternaryamine) and acrylic acid (AA) - DMDAAC:quaternaryamine copolymer.

8. The method of Claim 7 wherein the amphoteric dispersant is employed at a level of from about 1.0 percent active dispersant by weight PCC to about 5.0 percent active dispersant by weight PCC.

9. The method of Claim 8 wherein the amphoteric dispersant has a molecular weight ranging from about 2000 to about 10000.

10. The method of Claim 1 wherein the anionic dispersant is from the group consisting of sodium polyacrylates and copolymers of acrylic maleic acids.

11. The method of Claim 10 wherein the anionic dispersant is employed at a level of from about 1.0 percent active dispersant by weight PCC to about 5.0 percent active dispersant by weight PCC.

12. The method of Claim 11 wherein the anionic dispersant has a molecular weight ranging from about 2000 to about 10000.

13. The method of Claim 1 wherein the PCC produced is from about 25 percent solids to about 65 percent solids concentration viscosity of from about 500 centipoise to about 1000 centipoise specific surface area of from about $60m^2/g$ to about $100m^2/g$ and surface charge of from about – (negative) 30 millivolt (mV) to about +5mV.

14. A coating formulation for ink jet recording paper comprising:

PCC produced from about 25 percent solids to about 65 percent solids concentration viscosity from about 500 centipoise to about 1000 centipoise specific surface area from about $60m^2/g$ to about $100m^2/g$ and surface charge from about – (negative) 30 millivolt (mV) to about +5mV and a binder.

15. The coating formulation of Claim 14 wherein the binder is selected from the group consisting of polyvinyl alcohol, polyvinyl acetate, oxidized starch, esterified starch, dextrin, carboxymethylcellulose, hydroxyethylcellulose, casein, gelatin, soybean protein, maleic anhydride resin, styrenebutadiene copolymer, methyl methacrylate-butadiene copolymer, acrylate and methacrylate polymers.

16. An ink jet recording paper comprising a paper base stock, having a coating comprising:

a milled precipitated calcium carbonate pigment, the pigment being produced by milling a precipitated calcium carbonate in the presence of an amphoteric or anionic dispersant wherein the milled precipitated calcium carbonate has a solids concentration from about

25 percent by weight to about 65 percent by weight concentration solids and a viscosity of from about 200 centipoise to about 2000 centipoise and a specific surface area from about $60m^2/g$ to about $100m^2/g$.

17. A method for producing a precipitated calcium carbonate for ink jet recording paper comprising:

a) Admixing calcium oxide with water to produce a calcium hydroxide slurry;

b) admixing a first amount of an organophosphonate followed by adding aluminum sulfate to the calcium hydroxide slurry;

c) introducing carbon dioxide to the calcium hydroxide slurry to produce a precipitated calcium carbonate slurry;

d) adding a second amount of organophosphonate to the precipitated calcium carbonate slurry;

e) admixing phosphoric acid to the precipitated calcium carbonate slurry;

f) screening and dewatering the calcium carbonate slurry;

g) milling the precipitated calcium carbonate in the presence of an amphoteric or anionic dispersant to produce a precipitated calcium carbonate product; and,

h) coating at least one side of a paper base stock with a coating formulation comprising the milled precipitated calcium carbonate and binder to form the ink jet recording paper.

18. A method according to Claim 1 wherein the milled PCC is used in ink jet coating formulations for paperboard transparency, fabric, and tee-shirt iron-ons.